Digital Strategy
2019-2026

Foreword

The opportunity to support innovation and transformation of healthcare services using information and digital technology is significant and now is the time for us to realise and exploit this potential.

In the past 5 years we have delivered a range of new clinical systems including clinical portal, eCasenote, Maternity, Theatre Management System and a working test of Hospital Electronic Prescribing and Medicine Administration.   These systems have delivered a wide range of benefits across primary and secondary care.

This Digital Strategy sets out a vision and roadmap over the next 7 years for the development and implementation of digital services to support the delivery of our healthcare strategy Achieving Excellence.

We are seeking service transformation enabled by digital innovation and real time information providing the potential for safe, smarter and more efficient care built around earlier interventions.

We will engage and work closely with staff and the public to ensure that we deliver solutions that are fit for purpose and enhance the experience of our health and care services.

Donald Wilson

Director Information and Digital

April 2019

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1. Introduction

BACKGROUND

Scotland has been recognised over the last 10 years as one of the leading countries in the early adoption of digital technology and for delivering a series of successful eHealth strategies. NHS Lanarkshire (NHSL) has been at the forefront of many of the initiatives in Scotland working at local, regional and national levels. The pace of change and emerging technologies means, if Scotland is to remain at the forefront of digital innovation, it will have to move at pace to keep up with progress globally. The next 7 years presents unique healthcare challenges, yet also many major digital opportunities. This strategy is geared at accepting this as a collective challenge and states our intention to grasp new digital opportunities. A major transformational event will also be working from a single national digital platform. This means Scotland will not need to duplicate the same architecture across all boards, but simply make use of the single digital platform that will allow us to work smarter for the people of Scotland. Importantly the adoption and integration of solutions in all settings should be simpler, cheaper and faster. Information will follow the patients, wherever they may live, and new services can be added as demands change. This will also help establish a common look and feel for staff using the same systems in different roles as they work locally, regionally and nationally, allowing patient information to be available across Scotland, and provide the most effective and efficient cyber-security for the protection of our patient's information.

Why Digital?

Many industries have grasped the potential and opportunity for digital technology to help bring about transformational change. Our patients already extensively use digital in social-media to plan events, raise funds, find jobs, and communicate with their peers, family and work colleagues. It is the most common use of technology for finding, selecting, booking and paying for services online for example holidays, flights, hotels, banking, shopping, taxis, entertainment and travel, at almost every touch point in our lives is digital. Patients are 'active' and fundamental to the digital infrastructure of business like EasyJet, Amazon, Netflix, Booking and Uber. The combination of smart digital access and solutions, the 'active' person and a clear transactional process that can benefit the individual, is key to transformational change.

Health and Social Care has committed themselves to a rapid journey of service transformation and has great examples in specialist areas (telecare/telehealth) across first, second and third generation solutions for improving care at home and the application of telehealth. Digital is already delivering strong potential for keeping people safer in their community and at home, advising, monitoring and alerting when needed, with the ability to communicate and seek response and intervention when needed in the later generation solutions. Digital is proving to be a cost effective solution across Health and Social Care when used as part of a wider care package.

Patients already has extensive access to digital in their every-day life, but in the mainstream of health and social care, they remain largely 'passive' in the potential for digital solutions and possible transformational of health and social care. A digital platform for NHS Lanarkshire requires 'active' patients at the centre of care, managing their own care, being involved in decisions, evaluating and confirming approaches, and providing feedback on progress and communication. It is this active patient with suitable digital innovation that will bring about the primary transformation needed in the health and care sector in Scotland (and globally) to directly impact patients.

It is the 'active' patient that will best enable digital transformation in health and social care to take place. This strategy is not only about supporting systems, workflows and the workforce – but transforming the current approach from supporting over 10000 staff to 100000s of patients directly via digital solutions

Our Patients
Health starts with managing wellness, self-care, managing illness and managing care. Too frequently the first sign of trouble means a visit to the GP or A&E when symptoms become acute, an emergency, as the common option. Many people often only seek simple advice, reassurance, better self-care, or simply help for managing a condition that does not yet need clinical intervention. Offering alternative channels to provide advice, explain common conditions, how to best manage and provide tools to help may drastically help reduce the need for attending A&E or the GP. Digital services and

devices combined with access to better information offer a new range of tools which would be widely welcomed by a great number of our patients.

The primary impact is too many of our patients require admission to hospital for intervention and treatment, with frequent re-admission for similar or multiple conditions. Patients are not empowered within our current healthcare system. Most patients have limited access to key information about their personal health, or the digital tools to help manage their conditions or monitor their wellbeing. The potential for self-management for conditions like hypertension, cardio, obesity or diabetes is only possible when we also make the information between the healthcare professionals and the patient transparent and real-time. Prescribing a 'digital package' in collaboration with medicines, therapies and support can significantly impact the potential for a better quality of life for our patients (and carers). Hospitals & GPs could significantly reduce the need for admissions to hospital and/or unnecessary visits to the GPs by as much as 25% as the patient/carer becomes 'the expert' to manage their own conditions, with the help of technology, advice and support, other than by admission or via GP.

We are already managing acute patients in the community with the expertise of Hospital@Home (H@H), with potential for extending this service with monitoring technology. It will also enable the patient/carer to attend remote Multi-Disciplinary Team (MDT) meetings. This could allow the patient to stay at home (if this is a good fit) or in a care home setting without the added clinical risk of an unnecessary admission. This strategy provides an avenue to open up this type of approach for our patients to be at the 'centre and active' in their care, make informed choices based on

transparent patient information with their health care professionals and provide a basis for technology enabled pathway for patients to monitor, manage their conditions, live longer and have a better quality of life for them and their family.

Projection: Gartner USA

By 2023, 60% of population will have access to and control of their health data using a technology of their own choosing.

Our Healthcare Professionals

NHS has the best healthcare professionals in the world and are arguably the envy of many health systems, but they are a scarce resource and getting scarcer as the population ages and demands for healthcare increase. However, our approach to digital has yet to empower our patients to maximise the contribution to the management of their healthcare. There is little doubt other industries like aviation, defence, transportation, retail and banking have all gone through a significant transformational change using digital over the past 20 years. Health and care are immensely busy institutions with little opportunity for pause and reflection, and change is difficult. So we tend to continue to provide the digital equivalent of 'paper silos' by hosting many of our applications (that merely replicate the paper record process) for holding key information in applications with minimal functionality or benefit to either the healthcare professionals or patient, and limited or zero visibility for the patient. These systems/applications consume investment and resources from the core digital team whilst providing limited benefits at enterprise level health settings. Progression to enterprise wide Electronic Patient Record (EPR) is key for progressing the transformational change needed for the future and deliver these type services via level 3 EPR.

A combination of 'active patient and enterprise EPR' are central to the digital transformation of healthcare and how successful this strategy will be.

Our workforce

The biggest asset for NHS Lanarkshire is our staff, improving productivity and efficiency through a shared health record is essential. We have a huge diverse working community who all play key roles in the delivery of modern integrated healthcare. All staff require access to information and digital is key to providing for their future needs so we can provide the best and most efficient service for our patients. Digital has the potential to power the transformation for new processes and opportunity for the change to deliver new models of care. Our service managers need speedy access to accurate real-time information on the detailed performance of the service and identify emergent risks to individual patient care. The equity of digital access is becoming increasingly important for delivering real transformational change that impacts every contact point in care. Our future digital platform needs to support the spectrum of our workforce, and the patient transition to take more control of their care, clinical care, operations, management services and logistics. This means that digital needs to be at the centre of all our services with equity of access to allow transformational change across the whole organisation.

New Models of Care

As much as 70% of all healthcare today is spent on managing chronic conditions. Many of these patients have conditions that quickly progress to emergency admissions via the GP or via our emergency department. This significantly reduces our capacity to provide elective, planned care and delays only further increase in our emergencies. All patients can benefit from empowerment to manage their own care if provided the opportunity, technology and support to do so. These often can provide better long term outcomes without an admission. This requires the patient to be more active in their care, self-monitoring, access to simple digital devices and access to NHS advice including 1:1 support and delivered via mobile devices or web services. For those patients whose conditions require more active monitoring the need for remote monitoring and fast response of condition via our H@H expertise, telehealth and telecare services requires digital and a smarter infrastructure to help provide intervention when/if that need arises.

The role in wellbeing, prevention, Technology Enabled Care (TEC) and the potential for group therapies (virtual and physical) for the most common conditions like hypertension, obesity, diabetes or mental health with NHS Lanarkshire staff expert help + digital could potentially reduce the need for admission by as much as 30% and it could greatly improve the quality of life for a growing number of our patients suffering from these conditions and can severely reduce the quality of their (and their families) life. So digital working with new models of care has the potential not only to reduce the need for hospitalisation, but improve the quality of life, reduce the instance of relapse and, in some cases, help to reverse the condition.

Recent projections by Gartner in the US;

By 2023, US emergency department visits will be reduced by 20 million due to enrollment of chronically ill patients in artificial intelligence (AI) -enhanced virtual care.

By 2023, virtual encounters will exceed face-to-face care delivery encounters, resulting in a dramatic realignment of clinical care and health IT.

BEING DIGITAL SMART

The importance of **information** has always been recognised as key to safe care. But the speedy growth of digital information provides new dimensions and opportunities for making care safer and more efficient. Global investment in digital information, has for the first time, overtaken annual investment in EPR, a major statement on the importance and potential for digital information.

Global trends indicate the potential of EPR has delivered less value than expected across many health organisations. The EPR does, however, allow us to collect information digitally that will dramatically help improve the future options for predictive analysis, AI and analytics. Real Time Command Centres (RTCC) have little value when showing retrospective information, this belongs elsewhere. However, RTCC that have digital communication channels with the operational teams provide major opportunities to enable active intervention, improving quality of care, critical intervention, prevent adverse events and help the care system to remain effective and efficient in the key aspects of care. These are now being considered for use beyond the hospital, supporting TEC for earlier discharge, extended home monitoring and clinical intervention as well as providing potential for earlier diagnosis and intervention.

Recent Projections by Gartner in the US;
By 2023, one-third of healthcare providers globally will deploy cutting-edge clinical and operational command centres that will yield vital insights for real-time delivery excellence.

2. Drivers for Change

The common themes in health, not only in Scotland, but across the globe are the themes set-out in these papers;

Achieving Excellence 2017
2020 Vision
National Clinical Strategy for Scotland
Scotland Digital Health & Care Strategy
The Modern Outpatient
Quality Strategy

The themes in these reports are consistent across Europe and the USA.

This strategy sets out 10 themes[1] to deliver on the drivers of change;

- ➢ grasping the digital opportunities for our patients
- ➢ meet the changing needs of our patients
- ➢ support changing models of care
- ➢ deliver enterprise level clinical system

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[1] See Page 29

- ➢ continue to deliver the extensive service across NHS Lanarkshire
- ➢ migrate our service to a single digital platform for NHS Scotland
- ➢ make use of the benefits of a new platform around potential for agile and innovative new solutions, cheaper, easier and integrated
- ➢ Priority work in digital information, real time, command centres for intervention and improving patient safety
- ➢ turn off applications that are currently resource hungry with minimal benefit
- ➢ collaborate with our workforce to help maximise opportunity for digital working
- ➢ continue to support our range of business systems at a national level
- ➢ be transformative in terms of patient activity
- ➢ be transformative in terms of building a truly enterprise wide EPR
- ➢ review early options for digital innovations (next 3 years)
- ➢ review longer term options for innovation (next 10 years)

Progress (last 5 years) in clinical systems

In the last 5 years we have worked closely with our clinical leaders and have delivered new systems across our health community including;
- ➢ Maternity and Neo-Natal System
- ➢ Theatre Management System
- ➢ Hospital Electronic Prescribing and Medicine Administration
- ➢ Patient Management System (major upgrade)
- ➢ Clinical Portal (including eCasenote)
- ➢ Information Dashboards & Command Centre
- ➢ Technology Enabled Care
- ➢ Regional EPR
- ➢ GP Summary
- ➢ Cyber-Security Phase 1

'Digital innovation must be central, integral and underpin transformational change in health and care services to improve outcomes for people, as digital becomes a person's primary point of contact with the health service, allowing our clinicians to practice at the top of their license.'

3. A SHARED VISION FOR DIGITAL

THIS STRATEGY IS ABOUT THE PEOPLE OF LANARKSHIRE

This strategy is about a collective vision for combining the potential of digital technology and NHS Lanarkshire's collective 'know how' for the people of Lanarkshire, the workforce of NHS Lanarkshire, and our partner organisations in

North and South Lanarkshire Care Partnerships, Health and Social Care working across the voluntary sector, as well as doctors, nurses, allied health professionals, porters, ward assistants, medical records staff, secretaries, technologists and a whole range of other people to work together to help transform how we deliver services with a new range of digital solutions across our organisation. This strategy outlines our vision and roadmaps to deliver.

We plan to make the best use of a wide range of expertise. We are all learning from the experience of the past. The future is changing so fast with new demands, new solutions and new expectations from our patients, who are quickly becoming experts at understanding and managing their health conditions. That is why we need to make sure our **digital platform** can provide the latest clinical information to support the healthcare professionals, patient and the carer at home across a multitude of complex care settings, without physical, organisational or technical boundaries.

We are collectively planning a transformation that is fundamental to future services being delivered direct to patients and a significantly better experience for our clinicians and those who seek to use our digital solutions.

KEY PRINCIPLES FOR DEVELOPING AND SHARING THE VISION

➢ The vision is a journey, it will evolve with our key stakeholders and especially our patients

➢ The vision belongs to a wide mixture of stakeholders, but is largely driven by patients

➢ There will be no boundaries between care services

➢ We use digital to help achieve the most positive results for our patients, staff and clinicians

➢ Our staff need digital solutions to deliver safer, timely, efficient, equitable and effective care

➢ Transformational means healthcare professionals and patients create, share and validate the EPR as collaborative process between EPR and Patient Portal

➢ This process needs to demonstrate health and care transactions at scale

THE FUTURE INTEGRITY OF OUR SERVICE NEEDS

➢ Staff using digital solutions to improve care

➢ Direct patient involvement

➢ Staff progress to integrated EPR so that our healthcare professionals have access to the EPR across primary and secondary care

➢ Community, GP and Enterprise EPR come together to deliver a single view of a health and care record integrated with social care and accessed by the patient

➢ Patients can easily access key information via Patient Portal to help manage their personal care, appointments, letters, results, advice, tests and have a range of personal NHS applications to best manage their health

➢ Patients should help drive the need for new services and innovation.

PRINCIPLES AROUND FUTURE INVESTMENT INCLUDE

➢ Integrated care with the patient outcome at the centre

➢ Solutions delivering measurable improvement are affordable, implementable, secure and compliant with the strategic approach

➢ Principles of priorities, investment and business case are applied

➢ Interoperable and collaborative approach across NHS Scotland

➢ Geared towards working from a single digital platform

➢ Integrity of our 'business as usual' environment is maintained

➢ Meeting future patient, health and social care professionals needs

MEASUREMENT – HOW WILL WE MEASURE SUCCESS?

We will monitor our progress by measuring;

➢ reduction of paper-based processes

➢ increasing use of digital electronic health and care records

➢ greater adoption within multi-disciplinary and multi-agency teams

➢ increase use of digital in community settings

➢ improved data capture and data integrity

➢ more evidence of integration of records

➢ greater access by patients using online services

➢ systems ease of use

➢ information access is proving of high value

➢ user satisfaction levels

➢ measure impact of self-care using digital on service

4. TRANSFORMATIONAL CHANGE

Why Transformational?

In the next 7 years our strategic approach needs to make a transformation change around the **'patient and clinical experience'** + Innovation as our core of a transformational model. This moves us from managing the 10000+ users within NHS Lanarkshire to directly providing digital services to potentially over **655000 citizens** who are resident in Lanarkshire.

IN THIS STRATEGY PERIOD - OUR ROADMAP FOR CLINICAL SYSTEMS IS

2019	2020	2021	2022
Trakcare 2019	Lab Order Comms	Trakcare 2021	RIS/PACS
HePMA (Test of Change)	GP Order Comms	New GP System	Full Community Order Comms
Cambric Community System	Patientrack	Full Acute Order Comms	AI and Machine Learning Pilots
Hospital @ Home System	Lab Order Communications	Predictive Analysis	
Laboratory System	GP Order Communications	Voice Recognition Community	
Cathlab System	Active Clinical Notes	Full Interactive Patient Portal	
Healthshare	Voice Recognition Acute Care		
Patientrack (Test)	Respiratory Portal and Order Communications		
Digital Cancer MDT	Enhanced Maternity EPR		
Electronic Prescribing and Medicines Administration	Enterprise Digital MDT		
Electronic Data Capture in Community	Mobile Enabled PMS		
Hospital@Home elecronic data capture	Mobile Clinical Apps		
Clinical Portal electronic data capture and data repository	Serial Prescribing		
Electronic Handover	Clinical Decision Support		
Voice/Speech Recognition Test Project	Mobile Patient Apps		
Remote Consultations			

TRANSFORMATIONAL STEP ONE – **THE ACTIVE PATIENT**

The most effective care setting for many illnesses is the home. Empowering patients to manage their care at home will improve patient outcomes their quality of life and reduce the cost of healthcare.

In the next 7 years, our digital transformation will be measured not only by how good our systems are working across primary and secondary care, but how well we can directly support our patients allowing them to be 'active' in the management of their care, wherever they may choose to have their care delivered.

What we aim to deliver

We will support the National Patient Portal to enable the 'active patient' to deliver the opportunity for our patients to become more active in their own healthcare and integrate so they can play a key role including managing their own health and wellbeing, validating and contributing to their health record, receive care, support and monitoring when needed at home, at clinic or in the hospital.
This will include a range of incremental and pragmatic applications from appointment management, sharing and communicating with their healthcare professionals, getting best advice, joining community groups for mental health, diabetes and health and wellbeing should that be their priority.

There are already proven 'Test of Change' across NHS Lanarkshire including;

Virtual Clinics – Attend Anywhere

➢ Connecting with care teams using technology and a shared record via video consultation is no longer a 'test' but a service that can deliver benefits for all.
➢ This can include areas like remote assessments or patient online assessments across primary and secondary care settings.
➢ This would be supported by the National scale-up programme for Attend Anywhere.

Advice Referral

➢ Via SCI gateway and Trakcare, provide advice to GP including pre-referral and extending this advice back to the patient via portal in future.

➢ **Portal for Health and Care**

    ➢ Data exchange and patient wearables monitoring

➢ Access patient information direct to enterprise EPR & Patient Portal
Service Ended Self-Care

➢ Health and Care Record Integrated – share with portal

➢ Home and Mobile Health Monitoring

➢ **Self-Care**
- Link to Patient Portal and Home and Mobile Health Monitoring
- Explore the options for chatbots
- On-line advice and triage
- 1:1 advice from your healthcare professional
- Web forms for tests and assessments with GP and hospital

STRATEGIC ROADMAP – ACTIVE PATIENT

Active Patient RoadMap
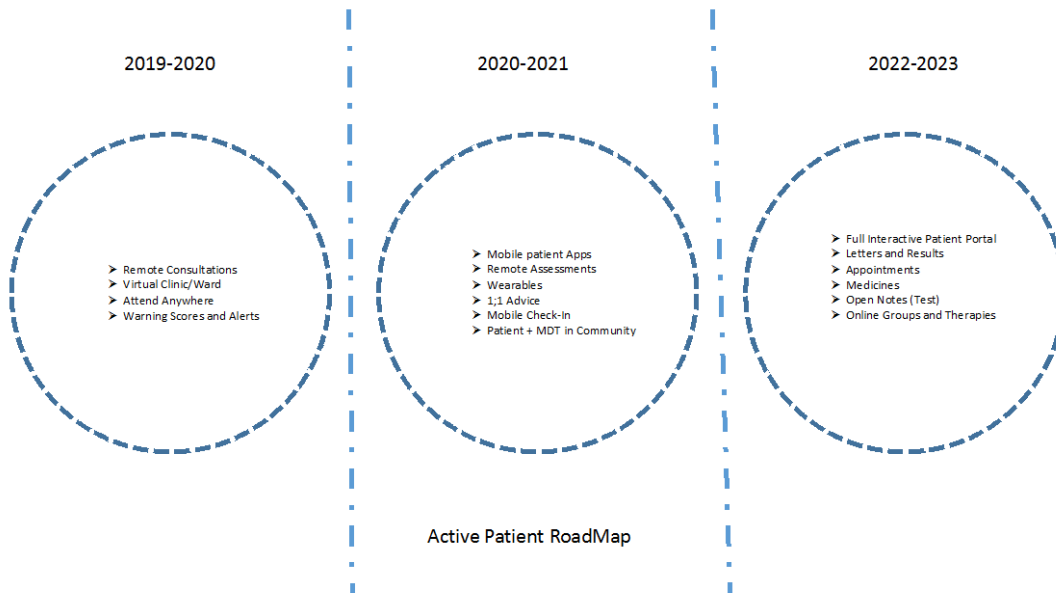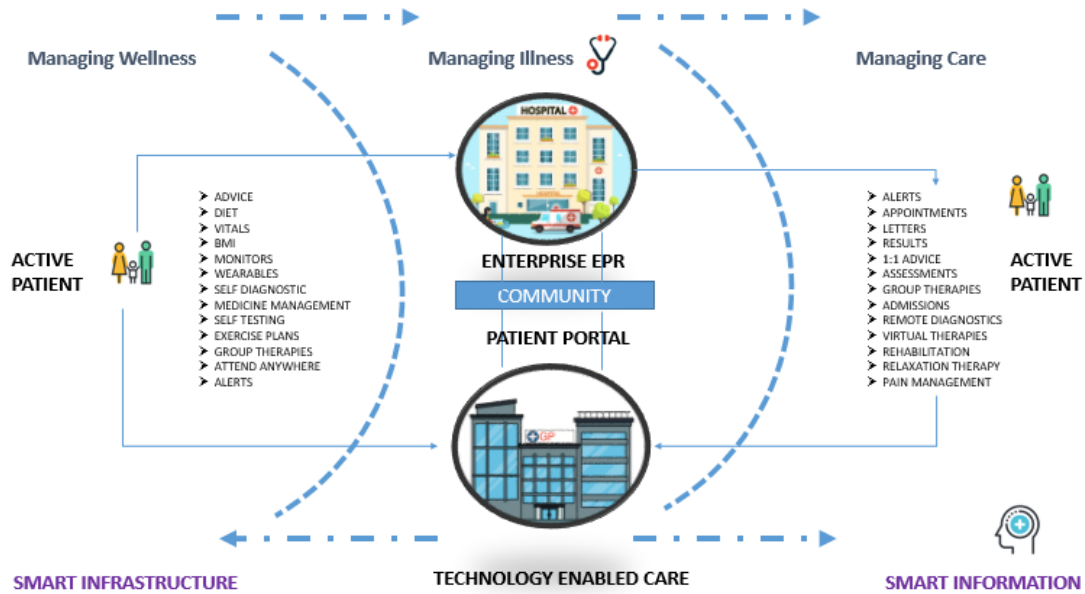
TRANSFORMATIONAL STEP TWO – THE CLINICAL EXPERIENCE

The 'clinical experience' using the current EPR (a combination of systems largely based around collecting and viewing via the clinical portal) is open to further improvement and supports a plan of progression towards enterprise EPR. Globally, it is recognised that health professionals spend twice as much time doing administration, clinical office, and finding information about their patients, than actually spending time with patients. Our aim is to reduce the time needed to find information, increase the amount of information that is digitally input, yet reduce the amount of time in administration and finding legacy information. This is setting a key challenge for the next 7 years but it is a challenge that needs to be grasped.

We are therefore seeking to;

Progress our **enterprise wide EPR to third generation model** in this next strategy period, providing a smarter record experience, explore the potential of digital innovation (Machine Learning) to help push information based on user role and behaviour rather than 'seek and find' information repeatedly. Supporting evidence based practice in helping healthcare professionals to improve care, levels of safety and consistency. This means replacing the current eCasenote service with a fully digital EPR at enterprise level for all categories of patient services.

Background to this theme:

In **international terms**, we currently operate across all levels of the model, in general terms between the 'collector' and 'documenter' level, which is second generation (according to the Gartner Model). To progress, we need to step up to third generation (helper) model in enterprise EPR to be able to fully demonstrate the potential for full digital transformation and help change the clinical experience using enterprise-wide digital systems. This is the level which already some applications already work, like diabetes is operating across healthcare professionals in primary and secondary care, and our patients are 'active' having access to their diabetic record.

Figure 2. The Evolution of EHR Systems
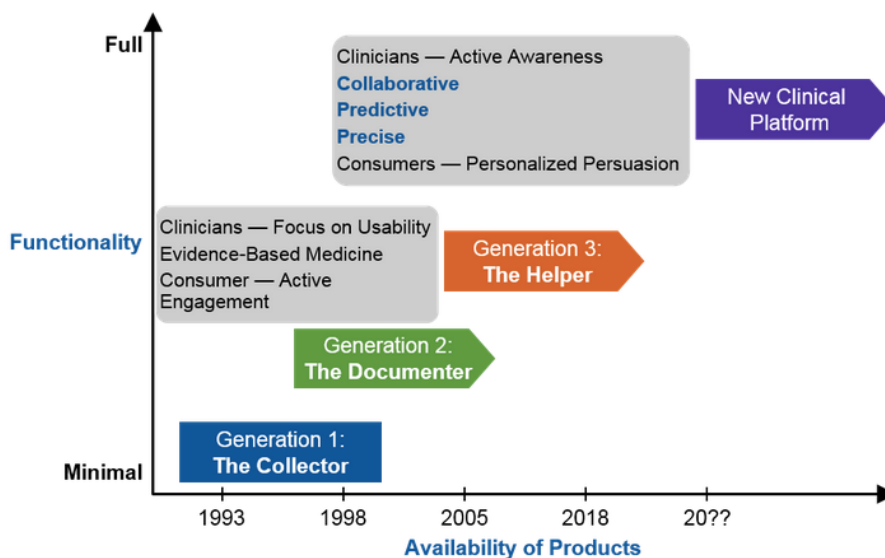
STRATEGIC ROADMAP – CLINICAL
Clinical Portal

➢ Continues to be the most used clinical system bringing together key information and will play a key role in the development of the enterprise wide EPR

Patient Management System

➢ Remains our primary system managing the patient administration. Includes the triaging of referrals, clinic appointments and scheduling diagnostic tests and procedures and is an essential tool towards building our enterprise EPR. Patient check-in (by a method they choose), recording clinic outcomes and appointment management will all be key for supporting EPR and Patient Portal in the next phase.

Integrated Community System

➢ This system is a replacement for MIDIS and will provide a modern mobile EPR across primary care. This will play a key role for patient portal information and managing patient care in the community as well as providing key information within the enterprise EPR.

Integrated Maternity System

➢ A single maternity record available across NHS GG&C, Forth Valley and Lanarkshire. Mobile working and desktop, ensuring a single record at point of care.

GP Systems

➢ Are well established clinical and appointment systems and are largely paperless. Electronic Document Transfer (EDT) transmits digital correspondence and messages from hospital services and digital dictation

systems directly into the GP system. The GP systems will be replaced during 2020-2021 with modern cloud based systems.

Our proposed priorities, working in collaboration with our clinical leadership and management teams , are we agree the following key themes in the next 7 years;

➢ Progress our **enterprise wide EPR to third generation model** within the period of the strategy, allowing a smarter record experience, explore the potential of digital innovation (AI and Machine Learning) to help push information based on user role and behaviour rather than 'seek and find' information repeatedly. Supporting evidence based practice in helping healthcare professionals to improve care, levels of safety and consistency. This means replacing the current eCasenote service with a fully digital EPR at enterprise level for all category of patient services.

➢ Adopt the national **Patient Portal** to allow the **'active patient'** to deliver the opportunity for our patients to become active in their own healthcare and integrate so they can play a key role, including managing their own health and wellbeing, validating and contributing to their health record, receive care, support and monitoring when needed at home, at clinic or in the hospital. This will include a range of practical applications from appointment management, sharing and communicating with their health professionals.

THE FOLLOWING TABLE PROVIDES A STRATEGIC VIEW OF HOW WE PLAN TO PROGRESS TO EPR LEVEL 3

2019	2020	2021	2022
Trakcare 2018	Lab Orders Communications	Trakcare 2021	RIS/PACS
HePMA (Test of Change)	GP Order Communications	New GP System	Full Community Order Comms
Cambric Community System	Patientrack	Full Acute order Comms	AI and Machine Learning Tests
Hospital@Home System	Active Clinic Notes	Predictive/Cognitive Analysis	
Laboratory System	Voice Recognition Acute Care	Voice Recognition Community	
Patientrack (Test)	Order Communications	Full Interactive Patient Portal	
Digital Cancer MDT	Enhanced Maternity EPR		
Electronic Data capture in Community	Enterprise Digital MDT		
H@H Electronic Data Capture	Mobile Enabled PMS		
Clinical Portal Data Capture/Data Repository	Mobile Clinical Apps		
Electronic Handover	Serial Prescribing		
Voice/Speech Recognition Test Project	Clinical Decision Support		
Remote Consultations	Mobile Patient Apps		
Electronic Prescribing and Medicines Administration			

Estimated Start Date of Projects/Programme

➢ Seek opportunity to explore the development of **a 'digital workforce'**. Our workforce already extensively use digital technology and have experienced the introduction of various technologies within the health space. We will seek to expand the use of digital technology within a **'digital hospital'** setting by working with a range of staff (from all aspects of the service – not only clinical and management), for seeking innovation and opportunity for change, being

more efficient, providing better 'non-clinical' services for patients, catering, entertainment, information, communication with families and help identify and prevent duplication and waste. It is not a good use of clinical time when health professionals have to return to their desks to check a result and find information to do their jobs. We are planning to deliver information direct to their mobile device and allow them to communicate, check tasks, allocate tasks with their team and eventually with patients direct.

➢ A **single digital platform** for Scotland. Progressing towards a single platform for Scotland means that we will not replicate the same across all boards, but use a single digital platform that can allow us to work in a regional and national way, simpler ways to add new services, common look and feel for our staff as we change roles and work across the country. This will provide a better and more efficient service for clinicians and patients, provide continuity of care across Scotland as patients move between centres of excellence. Clinicians should not have to continue to learn different systems as they change roles and locations. We will plan towards this single platform, look for opportunities to utilize national standards for enterprise applications that can add value and be easily integrated into the **enterprise EPR third generation.**

➢ This will also provide major opportunity for NHS Lanarkshire to focus on clinical applications to provide the best quality of care and service for clinicians and the speedy development of services directly to patients.
➢ Finally, the next generation of integration should be between care providers and patients, using a shared record. The national digital platform will provide the backbone which will enable future models of care.

TRANSFORMATIONAL STEP THREE – INFORMATION AND DATA

➢ **Information** is becoming the new central focus for healthcare providers across the world. For the first time (globally) health services are spending more investment in their **information service** than their EPR. Yet the reality is the EPR is a means to collect structured health data that can change the potential of our information to help reshape our ability to diagnose early, effective treatments, acute intervention, prevent error and improve health at the individual and population level.

➢ **Real time** information is already starting to focus in our command centre at University Hospital Monklands. Progressing this with **real-time health command centre** allows the enterprise to become safer, highly effective and more efficient. Digital innovations around collaborative work of EPR, algorithm medicine, genomics, opening the potential of our legacy information, all provide the real opportunity for 'big data' to help us find patients who need diagnostics/treatments early, provide the best treatment, reduce the need for unnecessary admission, allow people to have quality of life at home and keep patients safe in hospital, home or within their community.
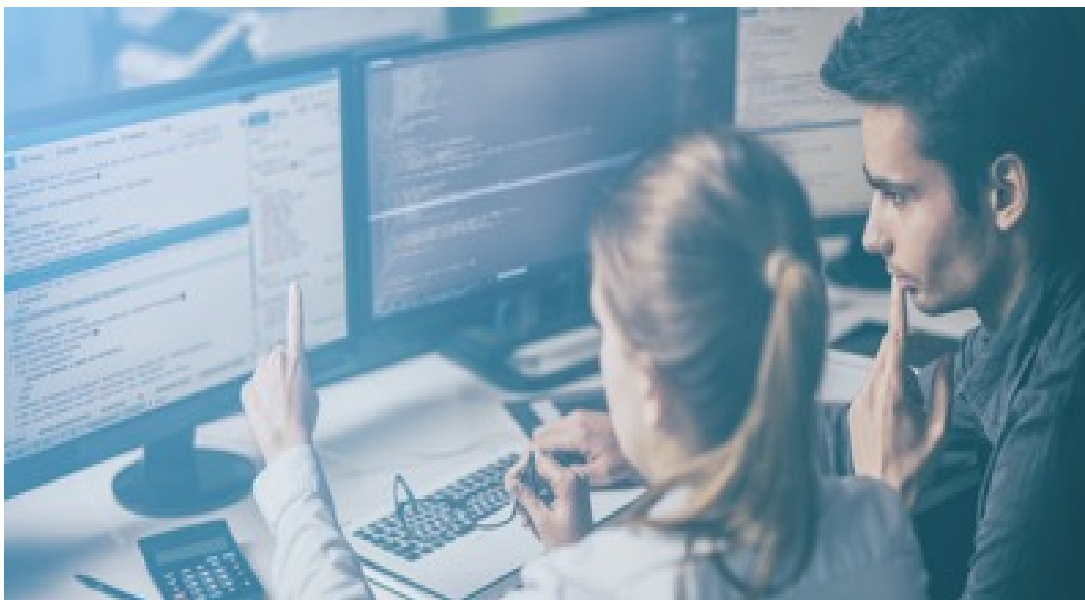

➢ **Infrastructure** is fundamental to everything current and future in digital. We have already discussed the potential benefits of working from a single digital platform across Scotland in the future. This may allow us to work

with our local infrastructure requirements to be geared at delivering the patient and clinical content and experience via a national platform.

➢ In the early stages we propose a review of the many applications that operate across NHS Lanarkshire (outside of the enterprise EPR or key clinical systems). There are many of these applications that provide minimal benefit to clinicians or patients, but consume significant resources from infrastructure. Other healthcare providers (like Kaiser Permanante) found significant savings by turning off applications for new investment in core/enterprise applications by reducing the number of applications used across the health space.

Infrastructure Roadmap 2019-2023

RoadMap – Technical Infrastructure
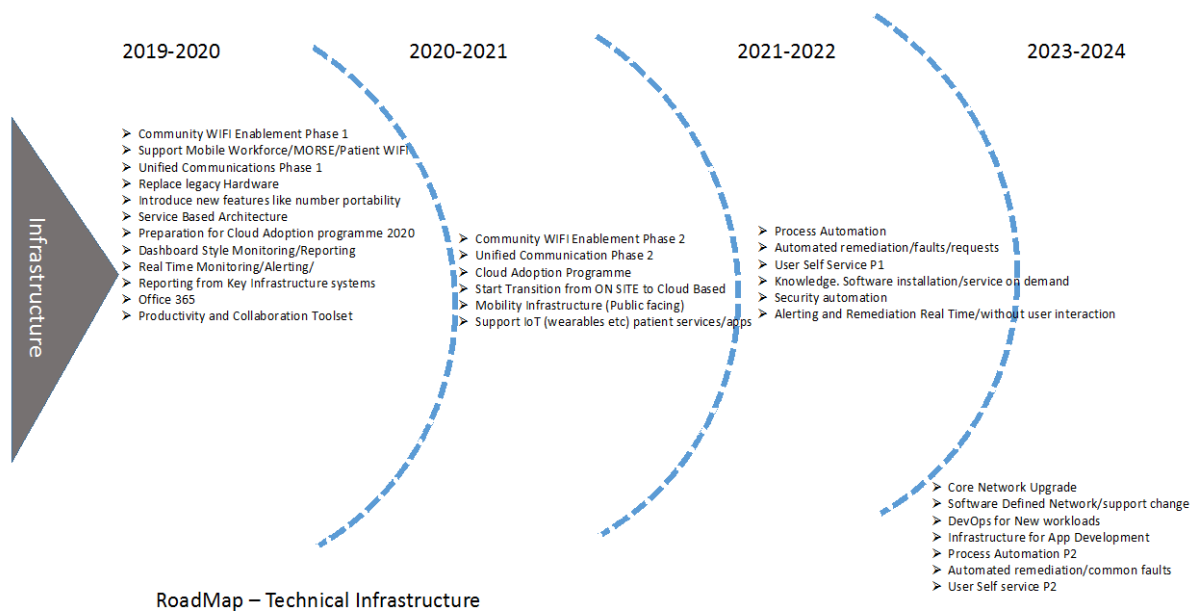
Digital Innovation

We will review a number of emerging issues, including;

 ➢ recording clinical information at the point of care

- remote monitoring
- prevention, detection, alerting and responding to falls
- patient applications
- healthcare interoperability
- virtual visits on demand
- consumer wearables
- digital clinical encounters

Real-Time Information:

- Alarms and notifications
- Clinical communication and collaboration
- Crisis and incident management
- End user experience monitoring
- Experiential wayfinding
- Medical device connectivity
- Interactive patient care
- Real time command and control centre

Cyber Security

- **Cyber Essentials**

A cornerstone of NHS Lanarkshire's approach to cyber security has been achieving Cyber Essentials accreditation (CE). CE is an official UK-wide, government endorsed accreditation scheme that assists organisations to guard against the most common cyber threats. As part of the Scottish Government Cyber Resilience Public Sector Action Plan (PSAP), NHS Lanarkshire achieved CE accreditation in October 2018. CE assists in improving information security by improving the management of risk in several key areas including software patching of systems to the latest version and ensuring that NHS Lanarkshire's IT is protected against 'malware' which can detrimentally affect the operation of systems. NHS Lanarkshire is currently in the process of working towards the higher level of accreditation represented by Cyber Essentials Plus (CE+). This provides for a higher level of assurance involving the same controls as Cyber Essentials but also includes the requirement for external testing to demonstrate compliance with these controls.

➢ **NIS (Network & Information Systems) Regulation**
Another recent change in the law in 2018 was the introduction of the NIS Regulations. These regulations require that important infrastructure organisations improve their ability to ensure that crucial network and information systems remain functional in the event of disruption and that their essential service remains available in all reasonable circumstances. NHS Scotland has adopted NIS and is aiming towards full implementation during 2019.

➢ **Security Management & Standards Adoption**
A key aspect of NHS Lanarkshire's approach to security management is that it regards threats to the security of patient and staff information to be ever present. The acceptance of this is a key principle of security by design and is reflected in the content of NHS Lanarkshire's Information Security Management System (ISMS). The ISMS comprises NHS Lanarkshire's information security policies and staff compliance with these is monitored via audit tools as well as completion of mandatory training.

➢ **Information Governance and Data Protection**
A major programme of work was completed in 2017/18 to ensure NHS Lanarkshire was working in compliance with the General Data Protection Regulation which came into law in May 2018. An active information governance programme is established to ensure the organisation remains compliant with the relevant data protection legislation.

➢ **NHS Lanarkshire Business Systems and National Services**

NHS Lanarkshire will continue to work with NES and NSS to transform business systems using modern digital delivery with a special focus on automation and self-service. It will continue to support and provide better access to data and analytics for supporting the workforce and financial planning. Currently there are a number of single instance 'once for Scotland' shared services across business systems. These include, eFinancials, eProcurement, Payroll and eESS (HR). Our aim is to move from these individual systems to a single 'Software as a Service' (SaaS) enterprise ERP solution for Scotland. The drivers are to improve user experience, reduce time spent on administration, freeing-up staff to focus on value-added activities. The vision is for an integrated digital landscape, founded on there being a single source of truth, where data is entered once, but can be utilised by any of the applications within our architecture.

Regional and National Collaboration & Transformation

Our patients and staff move frequently between hospitals and regions. There is little point in providing an interactive patient experience/enterprise EPR when this becomes unavailable if patients/staff move between hospitals/regions. A digital platform for Scotland will mean that patients and staff can access their shared record/and digital services wherever they are in Scotland.

We are already developing better integrated care by working in a regional setting across the West of Scotland with a shared EPR enabled by the Clinical Portal. This strategy will allow us to continue working regionally and progress readiness for the major transformation towards a national platform. This will enable a record/system to be available to staff and patients across Scotland. We will work closely to plan this migration over the next 3-5 years in collaboration with other Boards. This will enable innovation plans to be adopted more efficiently in cost and time, get more value from the systems we have, and the speedy adoption of new systems to keep with the pace of change in healthcare across Scotland.

SUMMARY - WE HAVE DEVELOPED 10 KEY THEMES FORMING THE BASIS OF OUR STRATEGY OVER THE NEXT 7 YEARS;

The **10 key themes** provided here as a strategic 'aide memoire' is the roadmap that will help digital play a key role for future working with patients, health professionals, managers, the NHS Lanarkshire workforce for building a more efficient and **safer health system** and make the transition needed to deliver successful/better outcomes for our patients in **new models of care**.

These themes will constantly be reflected in our strategic delivery plan in 2019-2026 and will be pivotal in evolving collectively towards a fully interactive digital system for our health community across Lanarkshire.

Theme		Name	Executive Summary
Theme 1		Electronic Patient Record	Develop our enterprise EPR to the next level (third generation) so we don't work in a mixed economy of having to find a mix of information between paper and digital. Use early Machine Learning and Artificial Intelligence to help present information based on our specific roles, reduce the need to constantly repeat clicks to find information, and change the workflow behaviours to allow access to patient recorded health information via enterprise EPR and the potential use of shared patient notes between patient and carer's.
Theme 2		Digital Workforce	Explore how we can work with our workforce to ensure we are digital ready for the coming period of change, evaluate current capacity and gaps and launch a programme to support change with the workforce. Our aim is to provide great information direct to their fingertips and unshackle care providers from their desks.
Theme 3		National Digital Platform	Plans to provide a single digital platform for Scotland will allow potential of new applications to be provided across the full enterprise at regional and national levels. This can add real clinical/patient value and can be integrated easily, quickly and cheaply to work with the enterprise EPR. We also mean to tackle the hundreds of applications that currently do not contribute to the enterprise record and seek ways to turn these off or integrate them into enterprise EPR with their clinical teams

Theme 4		The Active Patient	Provide access to our patients to their information, advice, applications, ability to communicate directly with their care providers, help them manage their own wellbeing, health, appointments, results and integrate their information with our enterprise EPR/Patient Portal services via the national digital platform.
Theme 5		Digital Information Services	Information is quickly becoming the key for early health intervention at community, individual and medical response levels. We are already looking at linking real-time information into command centre, digital recording options for information and the use of artificial intelligence for alerting risk areas like early warning scores (EWS) for a range of life threatening conditions. The potential is great for wider population health, AI and analytics can work in combination with key data in our enterprise is the leading innovation of our time and can help keep patients from becoming ill, intervene earlier to prevent hospitalisation and improve the quality of life for our people. This will be a high focus in the coming 7 years.
Theme 6		Smarter Infrastructure	Working within a single digital platform, and using a third generation enterprise EPR with the potential access openEHR applications that can easily/cheaply work with the EPR and the platform will make our infrastructure smart, adaptive, responsive and proactive. Explore how best to use this opportunity in year one.
Theme 7		Innovation	Innovation will be developed around the potential for digital innovation (digital encounters, remote working, monitoring and

			alerting, smart portal, machine learning and artificial intelligence) and information/informatics (real time information, smart analytics, AI, device connectivity)
Theme 8		Digital Efficiency	We will seek to find ways to make use of digital across the working space with the workforce, seek to identify solutions like using internet of things (IoT), seek to reduce duplication, repeats, delayed discharge, track patients, and equipment, and reduce waste.
Theme 9		Business Systems and Transition	This strategy needs to evolve whilst still providing this huge service to the workforce and our patients. There is always a temptation to just continue with 'day job', however, we need to balance continuing to deliver high quality digital services at the same time develop our transformational new services including our national business systems for finance, HR and procurement etc.
Theme 10		Digital Innovation and Research	Many of the biggest innovations will happen more than 10 years from now. We will set up a longer term innovation group and seek a local research partner university to work with us.

Our Enterprise level 3 – EPR Model

Generation	Name	Description	Potential Impact
Level 1	Collector	These are simple systems that are essentially results-reporting tools that enable multiple users to simultaneously access clinical data that previously may have been scattered among several systems or only available in a paper chart.	Improves clinical quality and patient safety by providing better access to the clinical record Reduces costs by cutting the need for paper storage, diminishing the need to transport records and identifying possible duplicate or unnecessary tests
Level 2	Documenter	These are basic systems that permit clinicians to begin to do more than access data (for example, perform at least rudimentary documentation). Functionality is minimally designed to cover a subset of care venues, including the ambulatory setting, medical/surgical wards, intensive care units and the emergency department.	Improves documentation completeness and legibility Streamlines interdepartmental workflows by permitting digital transmission of medication orders, lab test orders and results, and imaging requests and results Acclimates clinicians to the digital environment.
Level 3	Helper	These are complex systems designed to allow clinicians more direct interaction and help facilitate the practice of evidence-based medicine. Electronic Health Recrods at this level must provide functionality for ambulatory and all acute care settings, and have effective clinical decision support, workflow capacity for care plans, and clinical documentation and display, as well as	Provides organisations with the ability to significantly influence the care process for each patient in real time by: ➢ Assuring safety and preventing errors ➢ Encouraging consistency and standards of care ➢ Providing better document services for regulatory requirements, medicolegal needs, analytics and revenue optimization Facilitates dissemination of the latest evidence-based practices by alerting, reminding, nudging

		computer-based physician order entry.	and proactively escalating as necessary.

5.GOVERNANCE

HOW WILL WE MANAGE THE WIDE RANGING PROGRAMME OF WORK OVER THE NEXT 7 YEARS?

We will work collectively in collaboration with other health boards and the Scottish Government. There is an emerging governance process which is a balance mixed of collective governance across all boards in NHS Scotland including the NHS Lanarkshire governance structures.
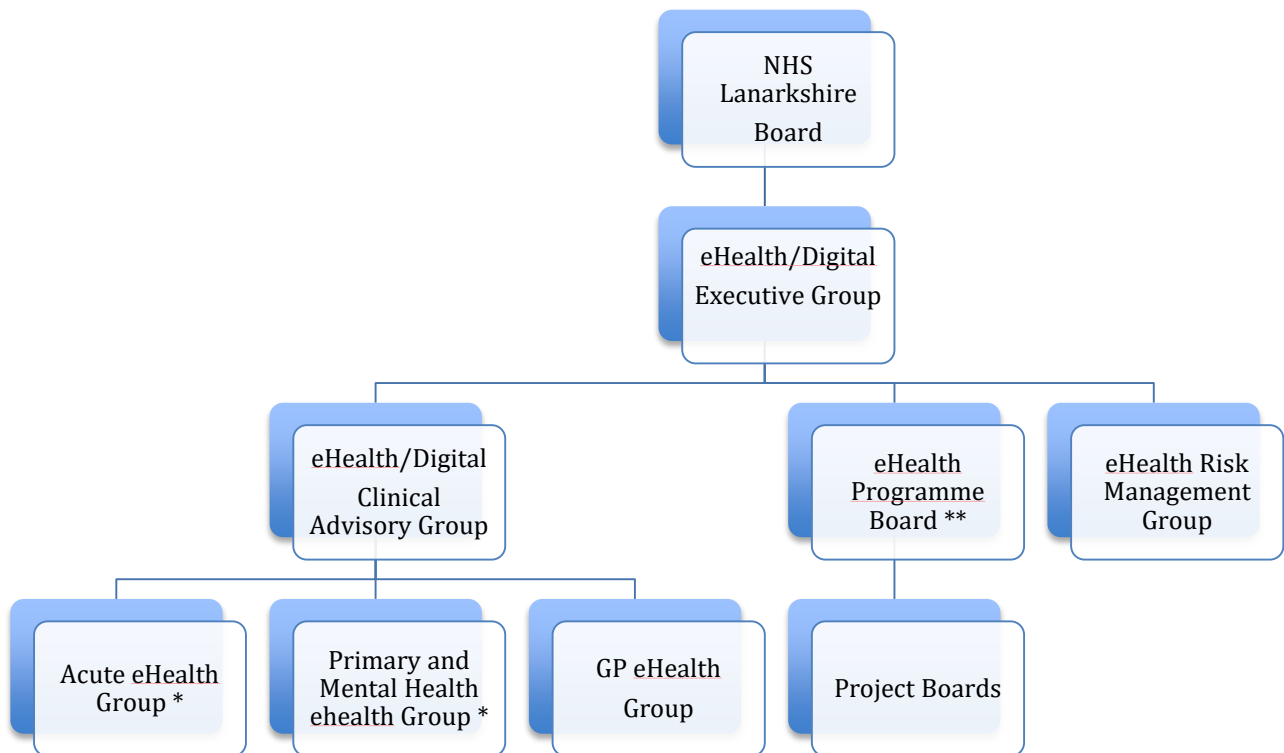
Figure 1 – NHS Lanarkshire Local Governance for eHealth

6. GET INVOLVED

With the increasing impact of ehealth/digital services across the organisation, it is important that we receive feedback from customers of the eHealth service – to ensure that the digital strategy continues to meet not only the strategic direction of the Board, and the Scottish Government, but also the needs of end-users.

If you want to provide feedback, comments or wish to get involved and help support the delivery of this strategy, please contact:

donald.wilson@lanarkshire.scot.nhs.uk

7. GLOSSARY

|	
A&E	Accident and Emergency
CCLG	Clinical Change and Leadership Group
CMT	Corporate Management Team
CCLG	Clinical Change Leadership Group
CHI	Community Health Index
CP	Clinical Portal
CSG	Clinical Steering Group
DNA	Did Not Attend
ECS	Emergency Call Centre
EDT	Electronic Document Transfer
EPR	Electronic Patient Records
eForms	Electronic Forms
eVetting	Electronic Vetting
Fairwarning	Electronic Monitoring of Access to Clinical Systems
GP	General Practitioner
HePMA	Hospital ePrescribing Medicine Administration
Healthcare professionals	Health care practitioner
IDL	Immediate Discharge Letter
IG	Information Governance
KIS	Key Information Summary
L	
MPI	Master Patient Index

MiDIS	Multi-Interdisciplinary Information System
Microstrategy	Provider of dashboard systems
OCRR	Order Communications Results Reporting
OOH	Out of Hours Service
OPERA	Theatre Management System
PACS	Picture Archiving and Communication System
PAS	Patient Administration System
PMS	Patient Management System
RIS	Radiology Imaging Application
SLA	Service Level Agreement
SOP	Standard Operating Procedure
TTG	Treatment Time Guarantee
Winscribe	Digital Dictation Provider

Building a more active patient platform
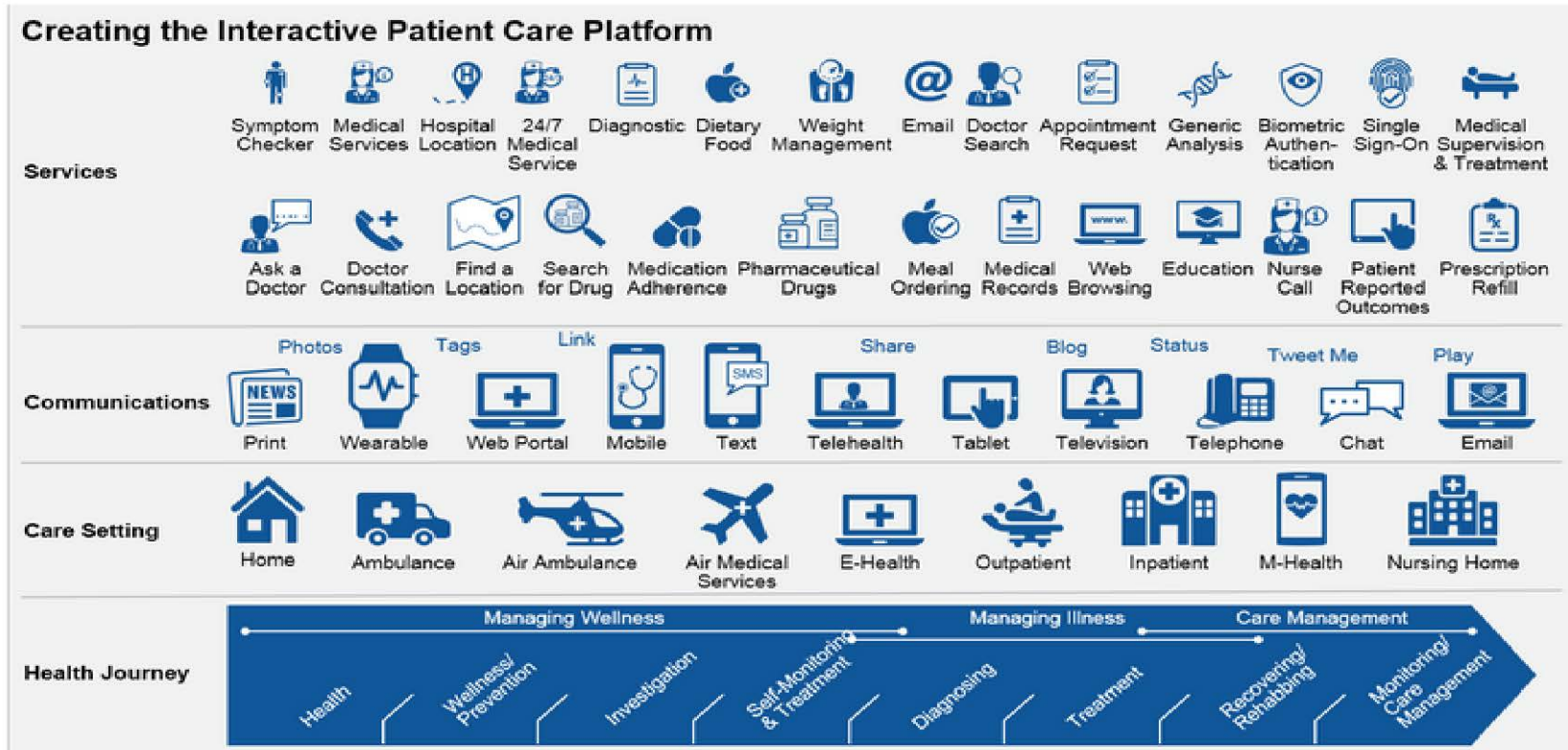
Single Digital Platform – Scotland Architecture
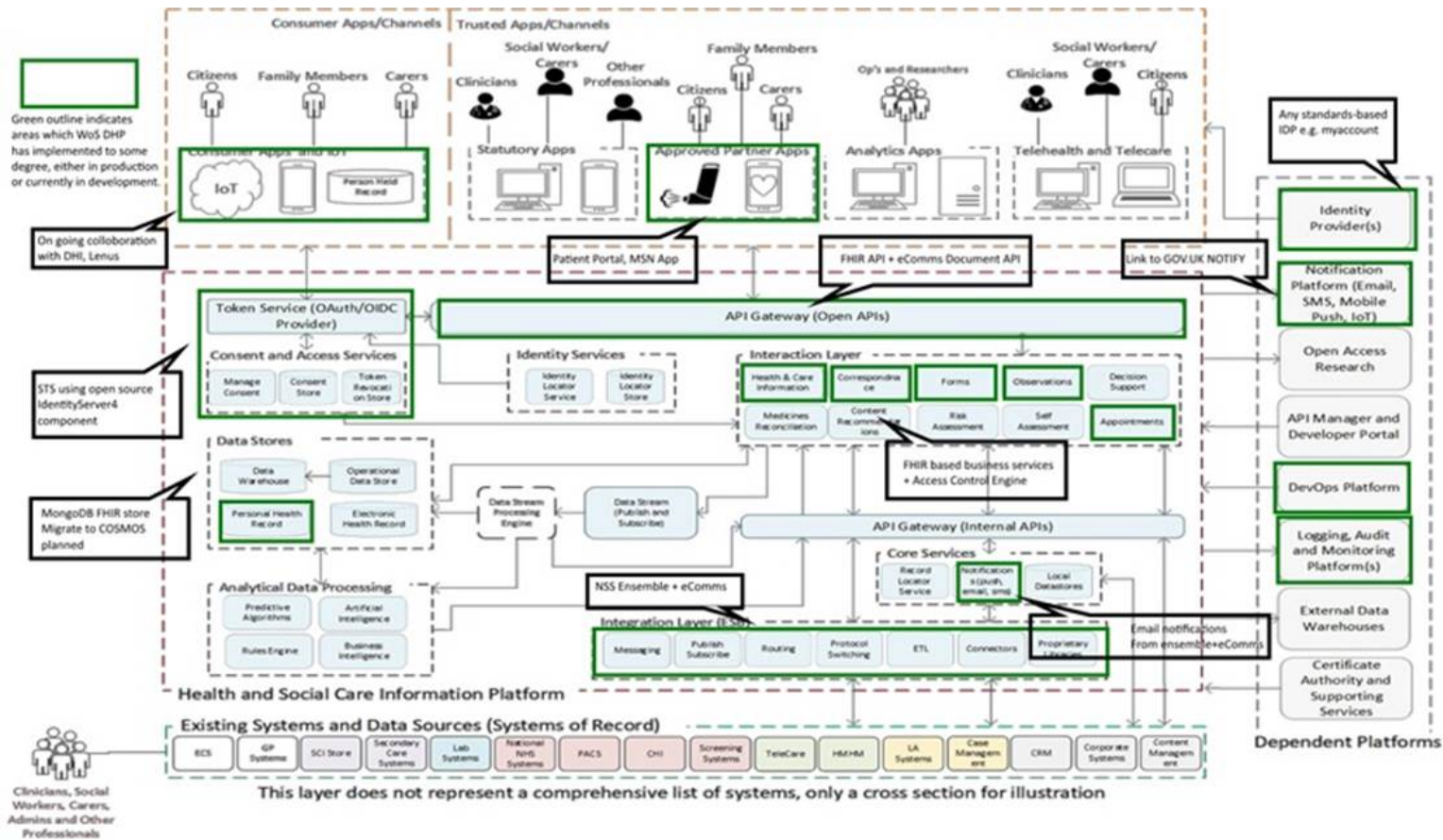
Strategy – Exploring Digital Innovation